

### **REMARKS**

Applicants express appreciation to the Examiner and the Examiner's Supervisor for conducting the recent telephone interview with Applicants' representative. A summary of the interview is submitted in this paper. Applicants have presented herein claim amendments consistent with those discussed during the interview. Additional claim amendments and the written response below are also provided in accordance with the interview discussion. Pursuant to the interview discussion and the amendments submitted with this paper it is believed the outstanding rejections have been addressed, the cited art has been overcome and the application is in condition for allowance.

#### **Status of the Claims**

Claim 30 has been canceled. Claims 21, 35, 52 and 50 have been amended. New Claim 53 has been added. Upon entry of the amendment, Claims 21-25, 27, 29 and 31-53 will be under consideration. Support for the amendments and new claim is found in the specification and claims as filed, see, e.g., paragraphs [0056], [0060]-[0062], [0067], [0069]-[0072], [0076] and FIGS. 6A, 6B with respect to Claim 21; paragraphs [0056], [0060]-[0062], [0067], [0069]-[0072], [0076] and FIGS. 6A, 6B with respect to Claim 35; paragraphs [0015], [0017]-[0018], [0025] and FIGS. 1, 4 with respect to Claim 42; paragraphs [0015], [0017]-[0018], [0025] and FIGS. 1, 4 with respect to Claim 50; and paragraphs [0058]-[0062] and FIGS. 6A, 6B with respect to Claim 53.

#### **Rejection under 35 U.S.C. § 103(a) – Warren and Danielsson**

Claims 21-25, 27 and 29-31 have been rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 1,616,774 ("Warren") in view of U.S. Patent No. 5,984,642 ("Danielsson"). Applicants respectfully traverse these rejections. It is well settled that the Examiner "bears the initial burden of presenting a *prima facie* case of unpatentability..." *In re Sullivan*, 498 F.3d 1345 (Fed. Cir. 2007). Until the Examiner has established a *prima facie* case of obviousness, the Applicants need not present arguments or evidence of non-obviousness. To establish a *prima facie* case of obviousness, the Examiner must establish at least three elements. First, the prior art reference (or references when combined) must teach or suggest all of the claim limitations: "All

words in a claim must be considered in judging the patentability of that claim against the prior art.” *In re Wilson*, 424 F.2d 1382, 165 U.S.P.Q. 494, 496 (CCPA 1970); *see also M.P.E.P. § 2143.03*. Second, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091 (Fed. Cir. 1986); *see also M.P.E.P. § 2143.02*. And finally, the Examiner must articulate some reason to modify or combine the cited references that renders the claim obvious. Merely establishing that the claimed elements can be found in the prior art is not sufficient to establish a *prima facie* case of obviousness:

As is clear from cases such as *Adams*, a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007) (emphasis added).

Instead, the Court has made clear that the Examiner must establish a reason one of skill in the art would have combined the elements of the prior art, and that such reason must be more than a conclusory statement that it would have been obvious.

Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit. *See In re Kahn*, 441 F.3d 977, 988 (C.A.Fed.2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”). *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1740-1741 (2007).

Claim 30 has been canceled. Amended Claim 21, from which Claims 22-25, 27, 29, and 31-34 depend, recites, *inter alia*, “a transfer chamber sealingly attached to the top of the vertically oriented cylinder at a position radially spaced apart from the first aperture such that a top portion of the hollow piston rod extends reciprocatingly and sealingly through a first aperture in the top of the vertically oriented cylinder and into the transfer chamber, wherein the first one-way valve is positioned to allow fluid flow from the hollow piston rod into the transfer chamber and wherein the piston rod does not contact an interior side surface of the transfer chamber.” (Emphasis added).

Neither Warren nor Danielsson teaches a transfer chamber with a piston rod wherein the piston rod does not contact an interior side surface of the transfer chamber. Warren teaches a hollow plunger with “upper end 25” extending into “chamber 43.” Warren at page 4 lines 111 to 127 and Fig. 1. “Chamber 43” is defined as the volume encased by the “fixed casing 42.” *Id.* at page 5 lines 23-33. This volume includes a protrusion extending upwards from the “head 26,” which contacts the hollow plunger. *Id.* at Figure 1. As the protrusion is part of the volume encased by the “elongated casing 42,” it is likewise part of the “chamber 43.”

The protrusion extending upwards from the “head 26” is also part of “chamber 43,” as clearly seen in Figure 2 of Warren, but which is also the case in Figure 1, because when the hollow plunger is at the bottom of its stroke, “upper end 25” is below the top edge of the hole in “head 26.” As “upper end 25” of the hollow plunger travels in and out of this upper area of the hole in the “head 26” that protrudes into “chamber 43,” fluid necessarily enters into this area where it remains until it is pumped out by the following up-stroke of the hollow plunger. Because the hollow plunger reciprocates in this upper area of the hole in “head 26” it is a portion of “chamber 43.” Because at least a portion of the hole in the protrusion extending from the “head 26” into “chamber 43” is part of that chamber, and because the hollow plunger contacts this area, Warren fails to teach or fairly suggest a piston rod that “does not contact an interior side surface of the transfer chamber.”

The device of Warren further fails to provide that “the piston rod does not contact an interior side surface of the transfer chamber” because the gap between the hollow plunger and the “elongated casing 42,” if a gap exists, is so small that contact between the plunger and the

"elongated casing 42" is inevitable. Because contact between the hollow plunger and the elongate casing is inevitable, Warren fails to teach a "piston rod [that] does not contact an interior side surface of the transfer chamber."

Danielsson does not include any teaching overcoming this deficiency of Warren. Danielsson teaches high-pressure cylinders 5, 6 sealingly attached to a low-pressure cylinder 1. *Danielsson* at col. 4 lines 46 to 54 and Figure 1. The low-pressure cylinder 1 is sealed by low-pressure seals. *Id.* at col. 5 lines 32 to 34 and Figure 1. The high-pressure cylinders 5, 6 are "sealed by means of high-pressure seals 18, 19." *Id.* at col. 5 lines 31 to 32 and Figure 1. As Figure 1 depicts the pressure intensifier in its "lefthand end position", the high-pressure pistons 9, 10 move to the right from this position and the high-pressure seals 18, 19 can only seal the high-pressure cylinder if they are part of the high-pressure pistons 9, 10. *Id.* at col. 5 lines 40 to 60 and Figure 1. Additionally, these high-pressure seals 18, 19 sealingly contact the "interior side surface" of the high-pressure cylinders 5, 6. Because the high-pressure pistons 9, 10 contact the side surfaces of the high-pressure cylinders 5, 6, Danielsson fails to provide a "piston rod [that] does not contact an interior side surface of the transfer chamber."

Moreover, neither Warren nor Danielsson teaches or fairly suggests "a transfer chamber sealingly attached to the top of the vertically oriented cylinder at a position radially spaced apart from the first aperture." Warren provides "an elongated casing 42 that is suitably attached fixedly to and is closed at its lower end by the head 26 of the pump barrel 10." *Warren* at page 3 lines 38 to 41 and Fig. 1. The "head 26" in Warren is separated from the "distinctly separate chamber 22", which "distinctly separate chamber 22 [is] in fact a working cylinder for a piston 23." *Id.* at page 2 line 57. Because Warren teaches the "elongated casing 42" attached to "head 26", it fails to provide "a transfer chamber sealingly attached to the top of the vertically oriented cylinder at a position radially spaced apart from the first aperture." Danielsson includes no teaching overcoming this deficiency of Warren. Instead, Danielsson teaches high-pressure cylinders 5, 6 sealingly attached to a low-pressure cylinder 1 positioned at the aperture. *Danielsson* at col. 4 lines 46 to 54 and Figure 1. Because the high-pressure cylinders 5, 6 are positioned at the aperture, they fail to teach "a transfer chamber sealingly attached to the top of the vertically oriented cylinder at a position radially spaced apart from the first aperture."

Because the combination of Warren and Danielsson fails to teach or fairly suggest a "piston rod [that] does not contact an interior side surface of the transfer chamber" or "a transfer chamber sealingly attached to the top of the vertically oriented cylinder at a position radially spaced apart from the first aperture," a *prima facie* case of obviousness cannot be established for amended Claim 21 and its corresponding dependent claims.

For at least for these reasons, Applicants respectfully request that the rejection be withdrawn.

**Rejection under 35 U.S.C. § 103(a) – Warren, Danielsson and Sweeney**

Claims 32, 33, and 35-41 have been rejected under 35 U.S.C. § 103(a) as obvious over Warren and Danielsson in view of U.S. Patent No. 6,193,476 ("Sweeney"). Applicants respectfully traverse the above rejections.

The criteria for establishing a *prima facie* case of obviousness are set forth above, as are the teachings of Warren and Danielsson,

The limitations of amended Claim 21, from which Claims 32 and 33 depend, are set forth above. As discussed above, the combination of Warren and Danielsson fails to teach or fairly suggest "a transfer chamber sealingly attached to the top of the vertically oriented cylinder at a position radially spaced apart from the first aperture . . . wherein the piston rod does not contact an interior side surface of the transfer chamber." Sweeney includes no teaching overcoming this deficiency of Warren and Danielsson. Sweeney merely teaches a production tube 47 that lacks a transfer chamber. Accordingly, the combination of Warren, Danielsson, and Sweeney fails to teach or fairly suggest "a transfer chamber sealingly attached to the top of the vertically oriented cylinder at a position radially spaced apart from the first aperture . . . wherein the piston rod does not contact an interior side surface of the transfer chamber" such that a *prima facie* case of obviousness of Claims 32 and 34 cannot be established.

Applicants assert a similar patentable distinction as that discussed above with respect to method Claim 35, from which Claims 36-41 depend, which recites a method for pumping fluid comprising introducing fluid into a pumping apparatus wherein a "transfer chamber is sealingly attached to the top of [a] vertically oriented cylinder in a position radially spaced apart from the first aperture such that the top portion of the hollow piston rod does not contact an interior side

surface of the transfer chamber as it rises upwardly through the first aperture.” Accordingly, the combination of Warren, Danielsson, and Sweeney fails to teach or fairly suggest a “transfer chamber is sealingly attached to the top of [a] vertically oriented cylinder in a position radially spaced apart from the first aperture such that the top portion of the hollow piston rod does not contact an interior side surface of the transfer chamber as it rises upwardly through the first aperture” such that a *prima facie* case of obviousness of Claims 35-41 cannot be established.

For at least for these reasons, Applicants respectfully request that the rejection be withdrawn.

**Rejection under 35 U.S.C. § 103(a) – Warren, Danielsson, Sweeney and English**

Claim 34 under 35 U.S.C. § 103(a) has been rejected as obvious over Warren, Danielsson and Sweeney in view of U.S. Patent No. 3,135,210 (“English”). Applicants respectfully traverse.

The criteria for establishing a *prima facie* case of obviousness are set forth above, as are the teachings of Warren and Danielsson and the limitations of amended Claim 21, from which Claim 34 depends. As discussed above, the combination of Warren, Danielsson, and Sweeney fails to teach or fairly suggest “a transfer chamber sealingly attached to the top of the vertically oriented cylinder at a position radially spaced apart from the first aperture . . . wherein the piston rod does not contact an interior side surface of the transfer chamber.” English includes no teaching overcoming this deficiency of Warren, Danielsson, and Sweeney. English merely teaches pump cylinders 20 that are attached to engine cylinders 12, 13 at the opening 18.

Because the combination of Warren, Danielsson, Sweeney, and English fails to teach or fairly suggest “a transfer chamber sealingly attached to the top of the vertically oriented cylinder at a position radially spaced apart from the first aperture . . . wherein the piston rod does not contact an interior side surface of the transfer chamber,” a *prima facie* case of obviousness cannot be established for Claim 34.

For at least for this reason, Applicants respectfully request that the rejection be withdrawn.

**Rejection under 35 U.S.C. §103(a) – Sweeney and Danielsson**

Claims 42-46 and 50-52 have been rejected under 35 U.S.C. 103(a) as obvious over Sweeney in view of Danielsson. Applicants respectfully traverse the above rejection.

The criteria for establishing a *prima facie* case of obviousness are set forth above, as are the teachings of Sweeney and Danielsson.

Amended Claim 42, from which Claims 43-46 depend, recites, *inter alia*, a piston type pumping apparatus wherein “the bottom portion of [a] piston rod has a diameter, wherein the piston rod diameter defines the bottom surface area of the piston rod that contacts the liquid, wherein the piston rod diameter is smaller than an inside diameter of [a] reload chamber.”

Neither Sweeney nor Danielsson teaches or fairly suggests this feature. Sweeney teaches a pump piston 43 with a pump piston base 37 and a fluid entry chamber 42. Sweeney at columns 3 lines 47 to column 4 line 18 and Figure 1. As shown in at least Figures 1-5 and as discussed in Sweeney column 4 lines 19 to 23, the pump piston base 37 has a diameter equal to that of the fluid entry chamber 42 and is in sealing contact with the walls of this chamber 42. Because the pump piston base 37 has a diameter equal to that of the fluid entry chamber 42, Sweeney fails to teach “the bottom portion of [a] piston rod has a diameter, wherein the piston rod diameter defines the bottom surface area of the piston rod that contacts the liquid, wherein the piston rod diameter is smaller than an inside diameter of [a] reload chamber.”

Danielsson teaches a piston with a first end 9 and a second end 10 which includes high pressure seals 18, 19 and a high pressure cylinder 5, 6. See, for example, Danielsson at columns 4 lines 65 to column 5 line 32 and Figure 1. The high pressure cylinders 5, 6 are “sealed by means of high pressure seals 18, 19.” See, for example, *id.* at column 5 lines 31 to 32 and Figure 1. As Figure 1 depicts the pressure intensifier in its “lefthand end position”, the high-pressure pistons 9, 10 move to the right from this position and the high-pressure seals 18, 19 can only seal the high-pressure cylinder if they are part of the high-pressure pistons 9, 10. See, for example, *id.* at column 5 lines 40 to 60 and Figure 1. As the high-pressure seals 18, 19 are necessarily part of the high-pressure piston 9, 10, the surface area of the high-pressure pistons 9, 10 that contacts the liquid includes the surface area of the high-pressure seals 18, 19. As shown in Figure 1 and as made clear in the specification of Danielsson, the diameter of the high-pressure pistons 9, 10 and their high-pressure seals 18, 19 are equal to that of the high-pressure cylinders 5, 6. See, for

example, *id.* at column 5 lines 31-34 and Figure 1. Because Danielsson teaches a high-pressure pistons 9, 10 whose diameter is equal to that of the high-pressure cylinders 5, 6, it fails to teach “the bottom portion of [a] piston rod has a diameter, wherein the piston rod diameter defines the bottom surface area of the piston rod that contacts the liquid, wherein the piston rod diameter is smaller than an inside diameter of [a] reload chamber.”

Because the combination of Sweeney and Danielsson fails to teach or fairly suggest “the bottom portion of [a] piston rod has a diameter, wherein the piston rod diameter defines the bottom surface area of the piston rod that contacts the liquid, wherein the piston rod diameter is smaller than an inside diameter of [a] reload chamber,” a *prima facie* case of obviousness cannot be established for Claims 42-46.

Amended Claim 50, from which Claims 51 and 52 depend, recites, *inter alia*, “a third chamber having a second aperture, the third chamber comprising an interior side surface, wherein the bottom portion of the piston rod portion of the piston and piston rod component is disposed within the second aperture, wherein no surface of the bottom portion of the piston rod portion of the piston and piston rod component contacts the interior side surface of the third chamber.” Neither Sweeney nor Danielsson teaches or fairly suggests this feature. First, as shown in at least Figures 1-5 and as discussed in Sweeney at column 4 lines 19 to 23, the pump piston base 37 is in sealing contact with the walls of this chamber 42. Because the pump piston base 37 has a diameter equal to that of the fluid entry chamber 42, Sweeney does not provide a structure where “no surface of the bottom portion of the piston rod portion of the piston and piston rod component contacts the interior side surface of the third chamber” as recited in Claim 50. Similarly, Danielsson teaches high-pressure pistons 9, 10 which include high-pressure seals 18, 19 and high-pressure cylinders 5, 6. As shown in Figure 1 and as discussed in Danielsson at column 5 lines 31 to 34, the high-pressure pistons 9, 10 contact the sides of the high-pressure cylinders 5, 6 with the high-pressure seals 18, 19. Because the high-pressure pistons 9, 10 contact the sides of the high-pressure cylinders 5, 6 Danielsson does not disclose a pumping apparatus where “no surface of the bottom portion of the piston rod portion of the piston and piston rod component contacts the interior side surface of the third chamber” as recited in Claim 50.



Because the combination of Sweeney and Danielsson fails to teach or fairly suggest a pumping apparatus where “no surface of the bottom portion of the piston rod portion of the piston and piston rod component contacts the interior side surface of the third chamber,” a *prima facie* case of obviousness cannot be established for Claims 50-52.

For at least for these reasons, Applicants respectfully request that the rejection be withdrawn.

**Rejection under 35 U.S.C. § 103(a) – Sweeney, Danielsson, and English**

Claims 47-49 have been rejected under 35 U.S.C. § 103(a) as obvious over Sweeney in view of Danielsson and English. Applicants respectfully traverse the rejection.

The criteria for establishing a *prima facie* case of obviousness are set forth above, as are the teachings of Sweeney, Danielsson and English and the limitations of amended Claim 42, from which Claims 47-49 depend.

As discussed above, the combination of Sweeney and Danielsson does not teach or fairly suggest “the bottom portion of [a] piston rod has a diameter, wherein the piston rod diameter defines the bottom surface area of the piston rod that contacts the liquid, wherein the piston rod diameter is smaller than an inside diameter of [a] reload chamber.” English includes no teachings overcoming this deficiency of Sweeney and Danielsson. English merely teaches pump pistons 22 that are the same diameter as the cylinders 20.

Because the combination of Sweeney, Danielsson, and English fails to teach or fairly suggest a pumping apparatus wherein “the bottom portion of [a] piston rod has a diameter, wherein the piston rod diameter defines the bottom surface area of the piston rod that contacts the liquid, wherein the piston rod diameter is smaller than an inside diameter of [a] reload chamber,” a *prima facie* case of obviousness cannot be established for Claims 47-49.

For at least for this reason, Applicants respectfully request that the rejection be withdrawn.

**No Disclaimers or Disavowals**

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, Applicants are not conceding in this application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application. Applicants reserve the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution. Accordingly, reviewers of this or any parent, child or related prosecution history shall not infer that Applicants have made any disclaimers or disavowals of any subject matter supported by the present application.

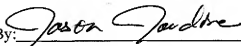
**CONCLUSION**

Applicants have endeavored to address each of the Examiner's outstanding rejections. In light of the above amendments and remarks it is believed that the claims are in condition for allowance. If any questions remain, Examiner is respectfully invited to call the undersigned at the telephone number below. Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

• Respectfully submitted,

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